

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Use of Spectrum Bands Above 24 GHz For Mobile)	GN Docket No. 14-177
Radio Services)	
)	

COMMENTS OF T-MOBILE USA, INC.

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T-Mobile USA, Inc. (“T-Mobile”)^{1/} submits these comments in response to the Fourth Further Notice of Proposed Rulemaking (“*Fourth Further Notice*”)^{2/} in the above-referenced proceeding in which the Commission proposes to adopt rules governing the licensing of millimeter wave spectrum that it has previously designated for Fifth Generation (“5G”) wireless services. T-Mobile applauds the important step the *Fourth Further Notice* represents towards ensuring that the United States can lead in making millimeter wave spectrum available for 5G use and encourages the Commission to adopt the proposed rules with clarifications and modifications suggested below.

I. INTRODUCTION AND SUMMARY

The *Fourth Further Notice* proposes to modify the rules for the 38.6-40 GHz band (“39 GHz band”), the 37.6-38.6 GHz band (“Upper 37 GHz band”), and the 47.2-48.2 GHz band (“47 GHz band”) to use 100 megahertz channels, rather than 200 megahertz channels;^{3/} and solicits input on plans to rationalize the spectrum holdings of incumbent licensees in the 39 GHz band in connection with an auction of that band, the Upper 37 GHz band, and a simultaneous auction of

^{1/} T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

^{2/} *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Fourth Further Notice of Proposed Rulemaking, FCC-18-110 (rel. Aug. 3, 2018).

^{3/} *Id.* at ¶¶ 9-13.

the 47 GHz band.^{4/} Under the Commission's proposal, prior to the auction, incumbent 39 GHz licensees would be permitted to participate in a pre-auction voucher exchange program.^{5/} An important goal of both components of the proposed auction process is to make available for licensing the maximum amount of unencumbered 39 GHz spectrum so that, after the auction, licensees will be authorized for spectrum that can be most effectively used to provide wireless services. The proposals in the *Fourth Further Notice* will, with modest modifications and clarifications, facilitate the most efficient licensing and use of the subject spectrum bands and should be promptly adopted.

II. THE COMMISSION SHOULD RECHANNELIZE THE UPPER 37, 39, AND 47 GHz BANDS

In the *Report and Order and Further Notice of Proposed Rulemaking* in this proceeding, the Commission adopted rules covering the licensing of the Upper 37 GHz, 39 GHz, and 47 GHz bands in 200 megahertz channels.^{6/} In the *Fourth Further Notice*, the Commission proposes to update its decision and instead license these three bands in 100 megahertz channels.^{7/} The Commission's proposal is appropriately driven by two reasons. First, as the Commission recognizes, incumbent licenses in the 39 GHz band are generally in non-contiguous 50 megahertz blocks.^{8/} That means any auction of the 39 GHz band may leave incumbent licensees (regardless of whether the Commission adopts its plan to rationalize the 39 GHz band plan) with less than all of the spectrum associated with a particular post-auction license. Licensing the 39

^{4/} *Id.* at ¶¶ 14-43. T-Mobile strongly supports including the 47 GHz band in this auction, along with any other millimeter wave spectrum the Commission is prepared to auction at that time.

^{5/} *Id.* at ¶¶ 31-37.

^{6/} *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, ¶¶ 82, 95, 121, 123 (2016).

^{7/} *Fourth Further Notice* ¶¶ 9-13.

^{8/} *Id.* at ¶ 9.

GHz band in 100 megahertz channels (particularly in combination with the Commission’s proposed auction structure) will facilitate current licensees acquiring new licenses in the auction for contiguous 100 megahertz channel blocks – the same amount of spectrum they hold today but configured consistently with the new 39 GHz band plan – without spending additional funds.^{9/} Creating blocks of 100 megahertz does not preclude the aggregation of larger ones, because the Commission has not proposed to (and generally need not) limit bidders’ ability to acquire multiple 39 GHz spectrum licenses in a market *a priori*.

The second basis for the Commission’s proposal to create 100 megahertz spectrum blocks is the anticipated use of the same size channel blocks for the 39 GHz, Upper 37 GHz, 47 GHz, and other millimeter wave bands. As T-Mobile has noted throughout this proceeding,^{10/} alignment in the rules for these bands is important, especially between the 39 GHz, adjacent Upper 37 GHz band, and the 47 GHz band, which Chairman Pai has announced he appropriately plans for the Commission to auction and license together – an approach T-Mobile supports.^{11/} Having channel blocks of the same size will increase efficiency by allowing participants to better

^{9/} As discussed below, participation in the pre-auction voucher exchange should result in the conversion of an incumbent’s entire 39 GHz license portfolio into vouchers, meaning it will no longer have any licensed spectrum in the band. The pre-auction voucher exchange, therefore, would allow incumbents to create rationalized spectrum rights, but not a spectrum license. An incumbent wishing to rationalize its licenses would ultimately need to do so through the forward auction. However, the proposed auction design allows incumbents to exchange “whole” vouchers into post-auction licenses without any additional payments.

^{10/} See *e.g. Comments of T-Mobile*, GN Docket No. 14-177 *et al.*, (filed Sept. 30, 2016).

^{11/} See *e.g. Fourth Further Notice*, Statement of Chairman Ajit Pai (“As part of our strategy to extend U.S. leadership in 5G, we intend to hold a single auction of the Upper 37 GHz, 39 GHz, and 47 GHz spectrum bands in the second half of 2019”); and Ajit Pai, Chairman, Federal Communications Commission, *Coming Home*, FCC Blog post, Jul. 11, 2018 (“Specifically, I’m excited to announce my plan to move forward with a single auction of three more millimeter-wave spectrum bands—the 37 GHz, 39 GHz, and 47 GHz bands—in the second half of 2019.”).

implement a bidding strategy that allows substitution and complementarities between all bands in that auction.

In addition to the 37 GHz, 39 GHz and 47 MHz bands, the Commission has proposed issuing authorizations based on 100 megahertz channels for other millimeter wave bands.^{12/} Creating 100 megahertz channels throughout the millimeter wave bands, where feasible, will result in useful harmonization. That harmonization will occur both on a domestic level and internationally, where standards are being developed based on 100 megahertz channels, as the Commission itself recognizes.^{13/} And, as noted above, smaller bandwidth licenses, which will still ensure sufficient capacity, will allow for a more efficient auction where bidders will be able to substitute their spectrum needs between bands because the license size will be consistent. Moreover, a consistent spectrum block size may facilitate secondary market transactions by creating more fungible licenses.

^{12/} See, e.g., *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988 at ¶ 35 (2017) (noting that 100 megahertz channels “allows for standardized channels across the band, at a size consistent with developing industry standards. This arrangement will maximize efficiency of spectrum use, especially in the upper segment”); and *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, GN Docket No. 14-177 *et al.*, Third Report and Order, Memorandum Opinion and Order, Third Further Notice of Proposed Rulemaking, FCC 18-73 at ¶ 28 (rel. Jun. 8, 2018) (noting that 100 megahertz channels “will allow for a sufficient acquisition of spectrum by smaller users while still allowing for aggregation by larger entities. We believe that 100 megahertz channels will be sufficient for a licensee to provide the type of high rate data services, and other innovative uses and applications, contemplated for this spectrum. These smaller channels offer an opportunity to provide low-barrier access to spectrum for new technologies and providers while also enhancing shared access methods and technologies between commercial and Federal users.”). T-Mobile recognizes that in some millimeter wave bands, 100 megahertz channel blocks may be undesirable or infeasible. For example, in the 28 GHz band, the Commission appropriately created two 425 megahertz blocks because of the presence of incumbents and the existing 850 megahertz channel block size.

^{13/} See *Fourth Further Notice* ¶ 10 n. 27, citing 3GPP’s 5G specifications for the 39 GHz band, 3GPP Release 15: 3GPP TS 38.101-2 V15.1.0 (2018-03), Section 5.3.5.

III. THE COMMISSION SHOULD GENERALLY EMPLOY THE PROPOSED AUCTION PROCESS

The Commission has correctly recognized that in order for the 39 GHz band to be licensed and used most efficiently, it should create opportunities for the auction of unencumbered spectrum blocks to the greatest extent possible.^{14/} Encumbered and misaligned license area boundaries increase administrative costs and infrastructure complexity, slow deployment, and require transaction costs to overcome the inefficiencies of secondary market transactions to rationalize the band. Nevertheless, incumbent licensees should also be able to emerge from any auction with approximately the same spectrum value they held pre-auction without spending money in the auction – they should not be materially disadvantaged by a repacking process. The Commission’s proposed auction structure generally accomplishes both of these goals. T-Mobile therefore supports the Commission’s proposal, consistent with the suggested modifications and clarifications below.

T-Mobile understands that the auction design would involve five components.

- *First*, the Commission would permit all incumbent 39 GHz licensees that hold less than a full partial economic area (“PEA”) license (either because they hold a rectangular service area (“RSA”) authorization or because their current license is encumbered by an RSA licensee) to convert their spectrum holdings to vouchers and then trade, with the Commission at Commission-set exchange prices, these vouchers to rationalize and simplify their holdings by creating – to the maximum extent feasible – full or closer-to-

^{14/} *Id.* at ¶ 24.

full PEA voucher holdings.^{15/} The value of each voucher at the conclusion of the auction would be based on the MHz-pop value of its geographic area.^{16/}

- *Second*, in advance of a forward auction, incumbent licensees that did not participate in the pre-auction exchange would have an opportunity to surrender their existing licenses in exchange for vouchers.^{17/} As noted below, T-Mobile suggests that the Commission further clarify that every incumbent licensee would automatically receive a voucher (or vouchers) for all of its existing licenses in the 39 GHz band by declaring its intention to enter the auction – and would either apply the value of those voucher(s) toward any licenses for which it is the high bidder or receive cash at the end of the auction based on the value of the voucher(s), as determined by bidding in the auction.
- *Third*, after the pre-auction voucher exchange and incumbent licensees' declaration that they intend to participate in the auction, the Commission would conduct a repacking process of incumbent licensees that did not participate in either process.^{18/}
- *Fourth*, the Commission would conduct a forward clock auction in which all available spectrum in both the Upper 37 GHz band and 39 GHz band, (presumably along with a simultaneous auction of the 47 GHz band), would be available for bidding.^{19/}

^{15/} *Id.* at ¶¶ 31-37. As noted above, this rationalization and simplification would apply only to holdings in the form of vouchers; upon agreeing to participate in the auction or pre-auction exchange, an incumbent should be deemed to have automatically converted all of its existing licenses into vouchers and can only convert those vouchers back into licenses using them as payments at the end of the forward auction.

^{16/} *Id.* at ¶ 20. These vouchers could then be either applied toward the purchase of PEA licenses for which the incumbent licensee is the winning bidder or exchanged for cash.

^{17/} *Id.* at ¶¶ 16-31.

^{18/} *Id.* at ¶¶ 38-43. The Commission must also address the time by which licensees are obligated to relocate to their repacked channels and other issues governing the repacking process.

^{19/} *Id.* at ¶¶ 17-18.

- *Finally*, the Commission would hold an assignment phase of the forward auction, in which bidders from the clock phase will be able to bid on particular frequencies.^{20/}

As described below, T-Mobile proposes that the Commission clarify that participation in any of the auction processes (other than repacking) would obligate an incumbent to convert *all of its holdings* in the band into vouchers, thereby including them in the forward auction. If all incumbents participate in these steps, the Commission expects that the 39 GHz band would be better rationalized and no repacking would be required, because participation would result in incumbent licensees holding only PEA-valued vouchers, not licenses, which would be applied toward new licenses or converted to cash.

A. Pre-Auction Voucher Exchange

T-Mobile supports the goals of the Commission's proposed pre-auction voucher exchange program – to incentivize incumbent participation and help the Commission auction unencumbered 39 GHz band licenses.^{21/} Nevertheless, the Commission may wish to consider whether similar results could be achieved by simply permitting incumbent licensees with less than full PEA holdings to obtain partial-PEA vouchers, without offering the opportunity to aggregate those partial-PEA vouchers in a pre-auction exchange and relying on relative pre-auction prices determined by the FCC. Those vouchers could be converted to cash or full licenses through the auction, at the auction-determined final prices. Eliminating the pre-auction voucher exchange may help expedite the adoption of rules governing the auction of the 37 GHz and 39 GHz bands by removing the need to create regulations for the pre-auction exchange process.

^{20/} *Id.* at ¶ 19.

^{21/} *Id.* at ¶¶ 31-37.

The Commission seeks comment on the interplay between the pre-auction voucher exchange, existing licensees, and the incentive auction.^{22/} The Commission plans for the forward auction of the Upper 37 GHz and 39 GHz (and presumably 47 GHz) bands to be conducted as a clock auction of generic spectrum blocks, an approach T-Mobile supports.^{23/} Therefore, if the Commission employs a pre-auction voucher exchange, it is most appropriate for any licensees that participate in that process (and as explained below, other incumbent licensees that plan to participate in the clock auction) to exchange all of their licenses in the band for the right to participate in the auction and receive vouchers. Licensees should only receive vouchers as a result of the exchange program and not partial licenses. The Commission therefore need not modify licenses between the exchange and the auction. If adopted, the voucher exchange program should be used to simplify the 39 GHz landscape. Allowing participating incumbents to only retain vouchers after the exchange is the best way to accomplish that. And because vouchers can only be used in the forward auction (either to purchase licenses or to be redeemed later for cash) any incumbent licensee that participates in the pre-auction voucher exchange must participate in the incentive auction (even if it does not seek to acquire licenses and merely wishes to convert its voucher to cash).^{24/} As suggested above, participating in the pre-auction exchange need not be a pre-condition for inclusion in the auction – holders of partial PEA or RSA licenses should still be able to obtain vouchers for their license holdings in advance of the auction. But if

^{22/} *Id.* at ¶ 37.

^{23/} *Id.* at ¶ 15. T-Mobile presumes that the Commission will conduct one clock auction for Upper 37 GHz/39 GHz and another for 47 GHz, but recognizes that the Commission has not yet proposed auction rules for these bands.

^{24/} Although, as T-Mobile suggests below, incumbent licensees that simply wish to convert vouchers to cash should be able to indicate that intent without the requirement to register to participate in the auction.

the Commission employs a pre-auction exchange, any participating entity should only receive vouchers and not licenses or modified licenses.

As the Commission notes, a pre-auction voucher exchange must minimize the potential for arbitrage.^{25/} If the Commission significantly overvalues the exchange rate for a spectrum block, incumbents could abuse the pre-auction voucher stage to achieve a windfall – aggregating vouchers that will enable them to acquire spectrum of greater value than their incumbent holdings. As noted above, this issue would be addressed by simply issuing vouchers for partial PEA and RSA licenses (along with full PEA licenses) as part of the auction process itself; the value of the vouchers would be established in the auction. However, if the Commission retains the pre-auction voucher exchange, to minimize the possibility of creating windfalls, the Commission should align the pre-auction voucher exchange rates as closely as possible with the ultimate auction prices; this is an admittedly difficult task, since the pre-auction exchange will necessarily occur before the auction takes place. However, the Commission will have conducted auctions of the 28 GHz and 24 GHz bands by the time it conducts the pre-auction process governing the 39 GHz band.^{26/} The pre-auction exchange rates should be based on those earlier millimeter wave auctions, where the spectrum characteristics are most similar. In particular, because of encumbrances in the 28 GHz band, T-Mobile encourages the Commission to tentatively rely on the results of the 24 GHz band auction in setting prices for any pre-auction vouchers.^{27/}

^{25/} *Fourth Further Notice* ¶ 35.

^{26/} Auction 101 for the 28 GHz band is scheduled to begin on November 14, 2018. Auction 102 for the 24 GHz band is scheduled to begin at the conclusion of Auction 101. *See Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services*, Public Notice FCC 18-109 (rel. Aug. 3, 2018).

^{27/} The Commission may establish the relative value of the pre-auction vouchers through the Public Notice it generally issues to establish procedures prior to an auction. At that time, the Commission will

In addition, the Commission proposes that incumbents would only be permitted to trade up or down to the nearest integer of an unimpaired PEA voucher, an approach that should also limit arbitrage.^{28/} T-Mobile supports this proposal if the Commission adopts the pre-auction voucher exchange plan. And, if the Commission adopts this approach, it need not bar voucher exchange participants from holding fractional vouchers at the end of the pre-auction exchange.^{29/}

B. Incentive Auction

T-Mobile supports the proposed incentive auction approach. It will help create access to unencumbered spectrum while providing incumbent licensees the ability to retain the value of their current spectrum holdings, which can then be converted to cash or used toward the purchase of spectrum for which they are the high bidder at auction. Licensees that offer their authorizations in the auction – as they should be required to do in order to participate in the forward auction – will receive credits exactly equal to the MHz-pop value of winning bids in the auction. So, for licensees seeking to simply preserve their spectrum holdings, the auction should be cash-neutral (at least for holders of full PEA licenses). And licensees that no longer wish to provide services using the 39 GHz band will have the opportunity to surrender their vouchers for cash – realizing the exact value of the spectrum as determined by a bidding process and avoiding transaction costs and coordination problems associated with secondary market transactions.

Proposed Clarification. As noted above, the Commission proposes that the forward auction be structured as a clock auction with generic spectrum blocks.^{30/} That means that

be better able to assess whether the auction results for the 24 GHz band are appropriate to use as a basis for the pre-auction voucher exchange rate at 39 GHz.

^{28/} *Fourth Further Notice* ¶ 34.

^{29/} If the Commission eliminates the pre-auction voucher exchange, then incumbent licensees will simply be issued vouchers for their fractional PEA interests in advance of the auction.

^{30/} *Fourth Further Notice* ¶ 15.

incumbent licensees cannot bid on “their” existing spectrum holdings – specific spectrum blocks will be the subject of a subsequent assignment round. Therefore, any incumbent licensee should be deemed to have surrendered “its” spectrum upon registering its intent to enter the auction. From that point forward, it should be considered to hold a voucher that can be used to purchase licenses for which it is the high bidder in the forward auction or surrendered for cash post-auction at the price in the generic forward auction, not including assignment round bids.^{31/} Of course, licensees may have full or partial PEA-valued vouchers depending on current license holdings. Licensees that hold full PEA-valued vouchers would be able to exchange them post-auction for full licenses in the same PEA with no additional cash payments required or to surrender the voucher to receive a cash payment post-auction. Licensees with only partial PEA-valued vouchers (whether obtained in the pre-auction voucher exchange or as part of registering for the auction) would receive a credit toward any payment they are required to make for licenses for which they are the high bidder or similarly be permitted to surrender the voucher to receive a cash payment post-auction.

Encouraging Incumbent Participation. In addition to requiring that incumbent participation in the forward auction be conditioned on offering all of their existing spectrum usage rights in the incentive auction (thereby converting those spectrum rights to full or partial PEA-valued vouchers),^{32/} the Commission can also encourage incumbent participation by adopting its proposal that incumbent vouchers be exchangeable throughout the 37 and 39 GHz bands (and any other bands, including 47 GHz, which are included in a simultaneously-conducted auction) and for cash at the end of the auction if an incumbent purchases licenses for

^{31/} Under the Commission’s formulation, a licensee would only “accept the voucher” when it requests a reduction in its demand. *Fourth Further Notice* ¶ 20.

^{32/} *Fourth Further Notice* ¶ 23.

less than the value of the vouchers they hold.^{33/} This will facilitate greater incumbent participation by allowing licensees to rationalize their spectrum holdings across multiple spectrum bands.

In order to further encourage participation by small entities that may be intimidated by the complexities and risks of this auction, the Commission may wish to consider adding an incentive component of the vouchers that incumbents holding small amounts of spectrum can obtain. This could potentially take the form of providing vouchers in the amount of 105% of their value for incumbent licensees holding less than 10% of the spectrum in a given PEA (and less than 1% of the overall spectrum available). The incentive might be used by incumbents that choose to exchange vouchers for cash. At a minimum, the Commission should aggressively promote participation in the auction to these incumbents and offer assistance to ensure they have a full understanding of the benefits (in particular, the option to receive vouchers for cash without having to engage in any market negotiations) and mechanics of participation. In particular, the Commission may wish to enable incumbent licensees to receive vouchers and automatically exchange them for cash at the end of the auction, without being required to register for bidding in the auction. Under this approach, incumbent licensees would be deemed to receive a voucher for their current licenses and simply paid at the end of the auction, rather than registering to participate in the auction and then making the decision to cash out.

The Commission can also increase incumbent participation by designing the auction software to provide the maximum amount of information possible to incumbents so as to ensure they know the value of their vouchers and can bid accordingly. Auction software should be able to be configured to show an incumbent, for each round, the current value of its vouchers. This

^{33/} *Id.* at ¶ 16.

will allow incumbents to assess, as they either bid on spectrum in the forward auction or monitor the value of the vouchers that they convert to cash, the anticipated post-auction obligation or opportunity for that entity.^{34/}

Encumbered Licenses. Because no incumbent licensee is required to participate in the auction, there may be encumbered spectrum blocks that the Commission will include in the 39 GHz auction. The Commission should auction those impaired licenses with separate clocks as it did in the 600 MHz auction to ensure that bidders know exactly what they are getting in the first phase of the auction.^{35/} The premise of the clock auction is that all licenses with the same clock will be fungible. But encumbered licenses will have different values, so they cannot be treated as fungible in the auction. The assignment phase, in which specific frequencies are selected, is too late for bidders to realize they are receiving encumbered licenses.

Insincere Bidding By Incumbents. The Commission requests comment on the risk of incumbents “gaming” the auction to inflate the value of their holdings.^{36/} While the Commission is justified in its concern, this risk is likely small. The risk of being left as an “accidental winner” in the auction outweighs the benefit available to an incumbent, particularly to one with a small holding in a given PEA. Incumbents with large holdings are likely to be net-buyers in the auction with no real incentive to take this risk. The fact that the Commission appropriately intends to auction the 39 GHz band and the Upper 37 GHz band together as one set of fungible

^{34/} While this information will be of value to incumbents regardless of participation in the forward auction, incumbents that have registered their intent to participate in the auction do not have the right to withdraw their spectrum from the forward auction regardless of the value of their vouchers.

^{35/} *Broadcast Incentive Auction Scheduled to Begin on March 29, 2016, Procedures for Competitive Bidding in Auction 1000, Including Initial Clearing Target Determination, Qualifying to Bid, and Bidding in Auctions 1001 (Reverse) and 1002 (Forward)*, Public Notice, 30 FCC Rcd. 8975 at ¶¶ 134-36 (rel. Aug. 11, 2015).

^{36/} *Fourth Further Notice* ¶ 25.

licenses in each PEA through a clock auction further reduces the ability of any one bidder to manipulate the auction, since it is only marginal demand which can increase the price, and there is little room for error in such false bidding. T-Mobile expects that the Commission would use the same “no excess supply” rule that it employed in the forward component of the broadcast incentive auction.

Bidding Credits. The unique nature of this auction requires a limitation on the use of bidding credits, as the Commission recognizes.^{37/} Such credits should only be applicable on amounts owed to the Commission *after* any voucher values are applied, and under no circumstances should bidding credits result in a net payment to an incumbent. The purpose of bidding credits is to level the playing field, so that small entities are not disadvantaged by bidding at the same price levels as larger entities. However, if an incumbent licensee’s voucher covers the entire cost of its spectrum purchase, there is no need for the bidding credit. Similarly, the Commission should not treat defaulters any differently in this auction, as providing special treatment risks increasing opportunities for inefficient arbitrage.^{38/}

Disparity Between Supply and Demand – Incumbent Licenses and Vouchers. The Commission also seeks comment on circumstances under which the demand by bidders in a PEA is less than the total supply of blocks made available for auction.^{39/} In order to address this issue, and to encourage use of vouchers, the Commission should prioritize the availability of less encumbered geographic areas and spectrum blocks over encumbered licenses. It should also

^{37/} *Id.* at ¶ 26.

^{38/} *Id.* at ¶ 26.

^{39/} *Id.* at ¶ 22.

provide cash payments to incumbents first (at minimum opening bid prices) in the event there is excess demand.

T-Mobile also urges the Commission to adopt mechanisms to allow the auction to close even when auction proceeds total less than the voucher payments owed to incumbents. Rather than preventing the close of the forward auction under those circumstances, it should adopt the proposed rule that it recalculate the amount of voucher payments, so that the payments do not exceed the available proceeds.^{40/} A way to reduce this potential problem is to set the opening bid amounts low, possibly even at zero, though a higher number may be preferable in order to encourage participation by incumbents.^{41/}

RSA Valuation. Finally, T-Mobile supports the Commission's proposals on how to calculate the value of each RSA-based voucher for the purposes of assigning cash values to incumbent holdings;^{42/} namely, by assigning an RSA credit for the population it covers, in the form of its proportion of the MHz-pop of the full PEA which contains it. RSAs that span multiple PEAs would receive fractional PEA-values in each PEA the RSA overlays (for example, if an RSA spans two PEAs it would be exchanged for two partial vouchers in those PEAs).

C. Repacking

T-Mobile agrees with the Commission's proposal that repacking be employed for incumbent licensees that do not participate in the auction process in order to maximize

^{40/} *Id.* at ¶ 27.

^{41/} In the very unlikely event that even with low opening prices, the overall revenue would not be enough to pay for all vouchers, all vouchers would be paid a fraction of the available proceeds. Alternatively, the Commission may wish to consider setting opening bid amounts based on a percentage of recent secondary market transactions, which would almost certainly result in there being sufficient revenue to pay voucher holders.

^{42/} *Fourth Further Notice* ¶ 20.

contiguous, geographically consistent license areas.^{43/} This will not only serve to protect incumbent operations but also to ensure that auction winners are able to make the most of their spectrum, bringing benefits to consumers more quickly and economically. While not ideal, repacking is the most efficient way to achieve these twin goals.

As noted above, T-Mobile hopes that the structure of the auction will provide sufficient incentive for all incumbents to participate in the incentive auction, which would mean no repacking would be necessary. Instead, the repacking would take place naturally as part of the auction, when incumbents wishing to continue to hold spectrum in these bands bid on full PEA licenses (using full or partial valued PEA vouchers and applying them toward the cost of the license). However, if repacking is required, T-Mobile assumes that the Commission will conduct that repacking process in advance of the auction for licensees that have neither participated in any pre-auction voucher exchange nor indicated their intent to participate in the auction (or, as suggested above, indicated that they will accept cash for their license). Making clear where incumbent repacking has occurred will allow the forward auction to proceed efficiently with encumbered and unencumbered licenses valued separately. And, repacked licensees should be situated at the upper end of the band. Leaving unencumbered spectrum in the lower range will allow licensees to take the greatest advantage of its adjacency to the 37 GHz band, which will be simultaneously auctioned as part of one clock auction. As the Commission noted in the *Fourth Further Notice*, the Commission retains, and has always retained, plenary authority to modify licenses (subject to due process) when doing so is in the public interest;^{44/} no licensee has an absolute legal right to any particular frequency block.

^{43/} *Id.* at ¶ 37.

^{44/} *Id.* at 27 (citing to 47 U.S.C. § 316(a)(1)).

D. Legal Authority

The Commission's legal authority to utilize incentive auctions is broad,^{45/} and the proposed auction procedures are well within that authority. The fact that participation by incumbents is conditioned on them also including their spectrum does not make that participation less than "voluntary." Incumbents only give up their rights to that specific spectrum license, not their spectrum rights generally, and even non-participating incumbent licensees may be repacked into different frequencies. The proposed voucher program allows them to bid on functionally identical spectrum at no additional cost, and indeed, are guaranteed a voucher of identical value to their holdings, which can be traded in for spectrum of identical value.^{46/} As noted above, the Commission retains plenary authority to modify licenses, which means the legal authority underlying the post-auction repack is solid.

The auction design the Commission proposes will not leave an incumbent worse off than it was initially. Absent *de minimis* logistical burdens potentially involved in repacking, incumbents will incur no costs from this proposal under any circumstances, only opportunities for gain, whether in the form of fuller-valued spectrum or the chance to receive a cash payment through an efficient auction with minimal transaction costs, far less than those involved in a secondary-market sale.

IV. CONCLUSION

The Commission's primary goal in creating rules for the Upper 37 GHz, 39 GHz, and 47 GHz bands should be to auction as much harmonized, unencumbered, rationalized spectrum as possible. In pursuit of this goal, T-Mobile supports the Commission's proposal to rechannelize

^{45/} See 47 U.S.C. § 309(j)(8)(G).

^{46/} Indeed, a pre-auction voucher exchange, if implemented, may improve some incumbent licensees' positions.

these bands with 100 megahertz channels, and to consider this the standard channel size for the millimeter wave bands where appropriate. T-Mobile also generally supports the Commission's proposed auction design, which encourages incumbent participation in order to make the forward auction a success. T-Mobile's proposed clarifications and modifications will help further those goals.

Respectfully submitted,

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